

CIMSS support of Imagery EDR team and Other JPSS Activities

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Outline



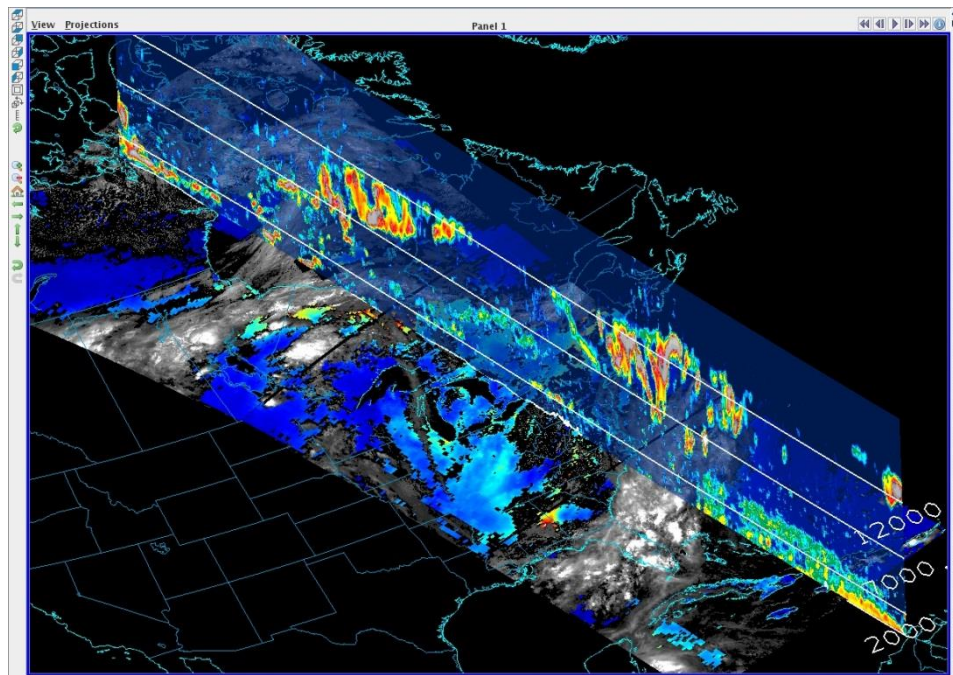
- Overview of McIDAS-V
- Examples
- McIDAS-V summary
- Other work

What is McIDAS-V

McIDAS-X → VisAD + IDV + HYDRA =



- **Integration of Geophysical Data**
- **Remote and Local Data Access**
- **Powerful Analysis Tools**
- **3D Visualization**
- **Ease of Re-projection**





Key Aspects of McIDAS-V

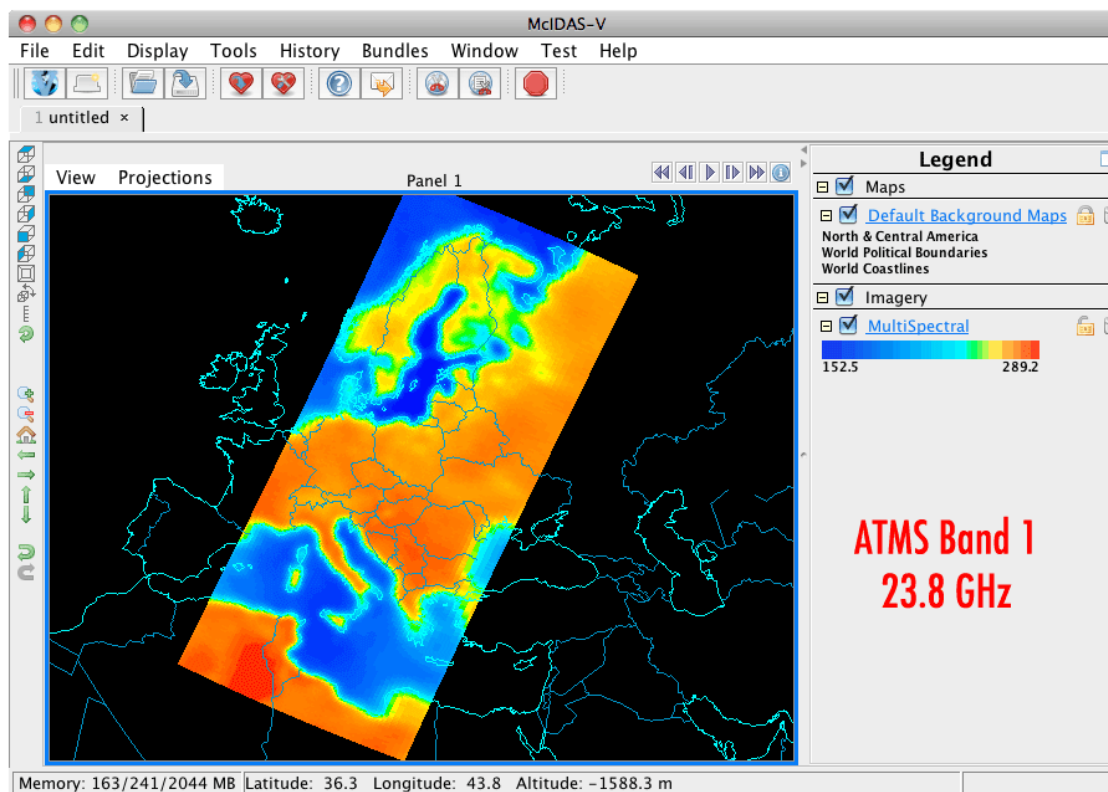


- **Built on top an extensible framework for adapting new sources of data (format and type, local or remote), user interface components and for creating novel displays and analysis techniques**
- **Developed in the Java programming language – object oriented, write once run anywhere, very portable**
- **Persistence mechanism (bundles) for saving and sharing interesting displays/analysis with other McIDAS-V users**
- **Python based user defined computation**
- **Open source, freely available, community driven software**
- **Is able to easily load and manipulate Suomi NPP (Block 1 and 2) and JPSS-1 simulated Block 2 data without any special readers**

- It has 5 instruments which retrieve data regarding the atmosphere, land and ocean. 3 of these instruments can be displayed in McIDAS-V
 - VIIRS
 - CERES
 - CrIS
 - ATMS
 - OMPS* (in testing)

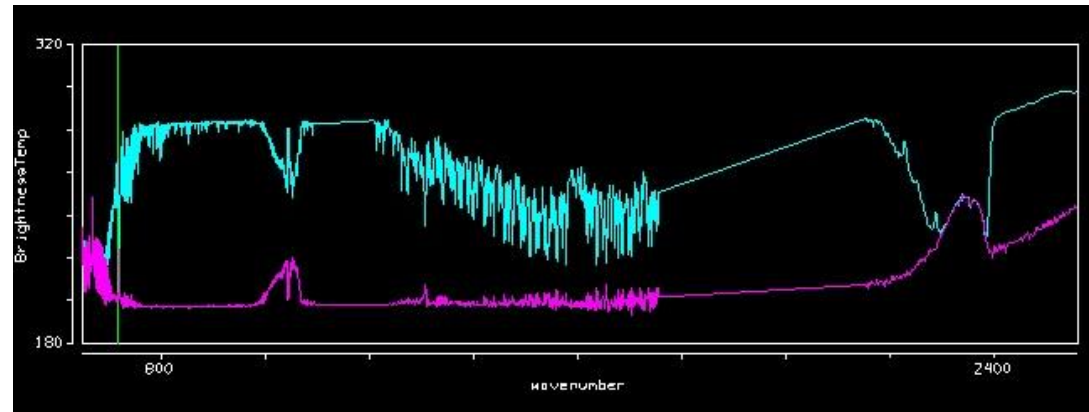
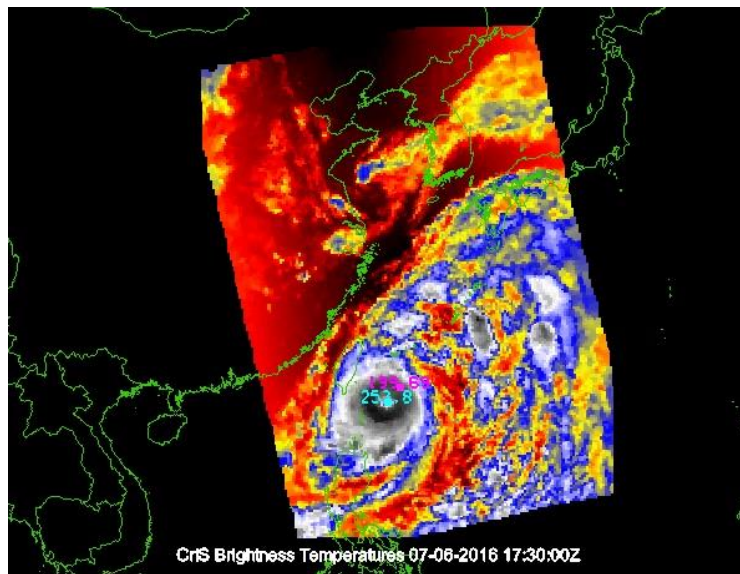
Advanced Technology Microwave Sounder (ATMS)

- 22 microwave channels, combining all the channels of the preceding AMSU-A1, AMSU-A2, and AMSU-B sensors into a single package
- Provides sounding observations needed to retrieve profiles of atmospheric temperature and moisture for forecasting models and continuity for climate monitoring purposes.



Cross-track Infrared Sounder (CrIS)

- 1,305 infrared spectral channels
- Designed to provide high vertical resolution information on the atmosphere's structure of temperature and water vapor.



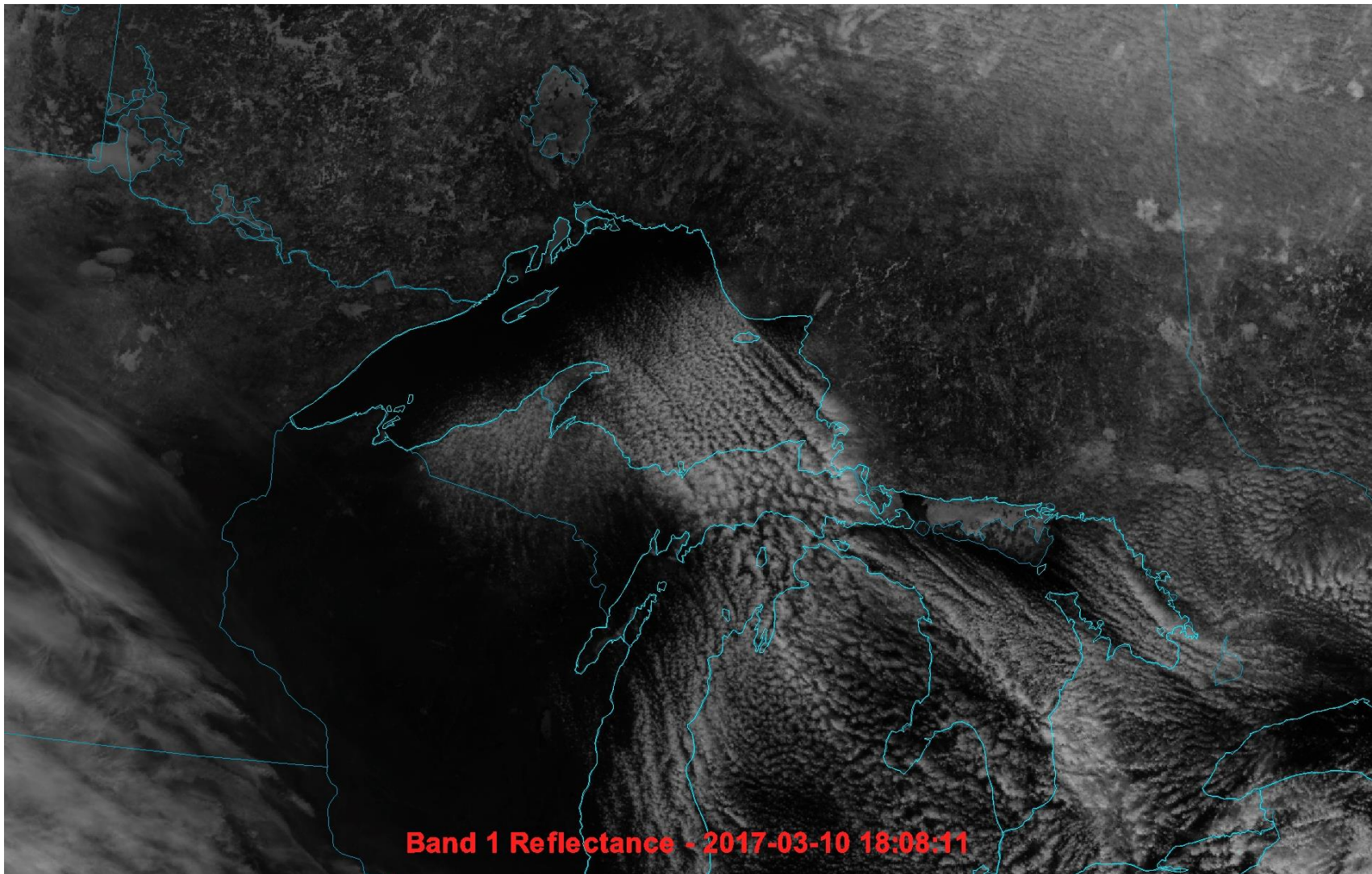


Visible Infrared Imaging Radiometer Suite (VIIRS)

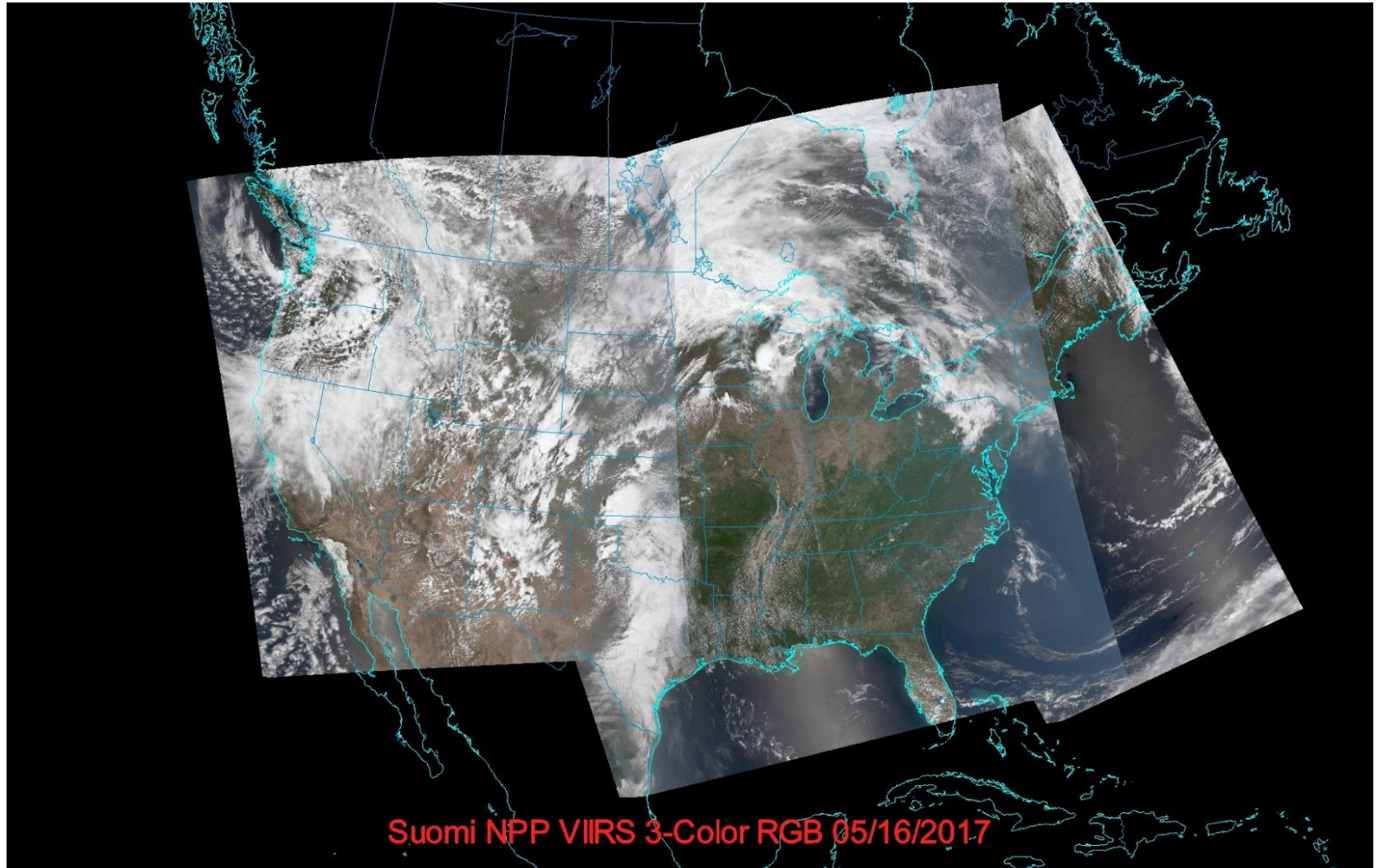


- Has 22 channels at three different resolutions
 - 16 Moderate Band (M-Band) channels (~750 m at nadir)
 - 5 high resolution (I-Band) channels (~375 m at nadir)
 - Day Night Band (~750 m at nadir)
- M and I band data encompass data from 412 nm to 12 μ m
- Used to produce Level 2 products

Multi-channel animation

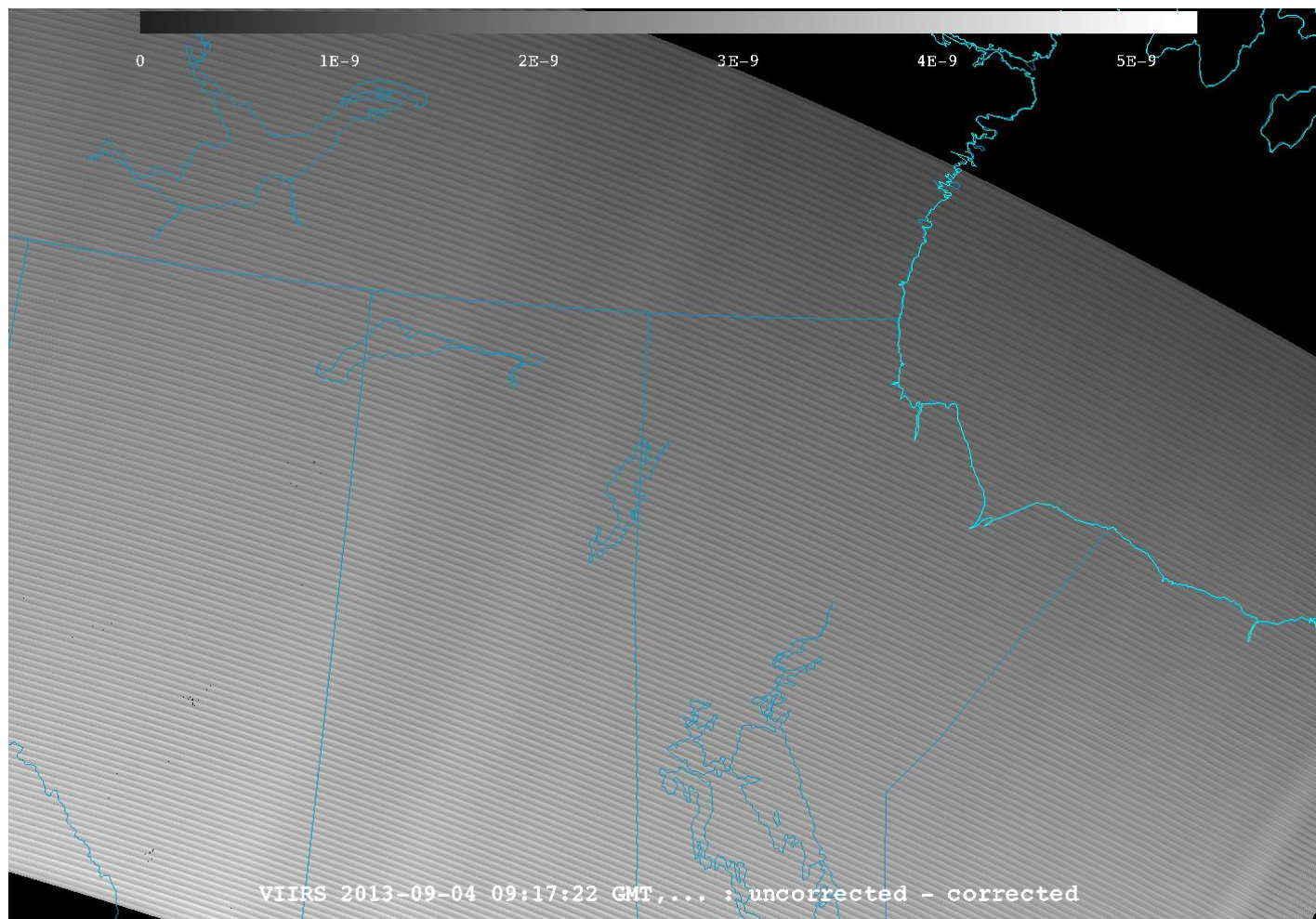


RGB composite

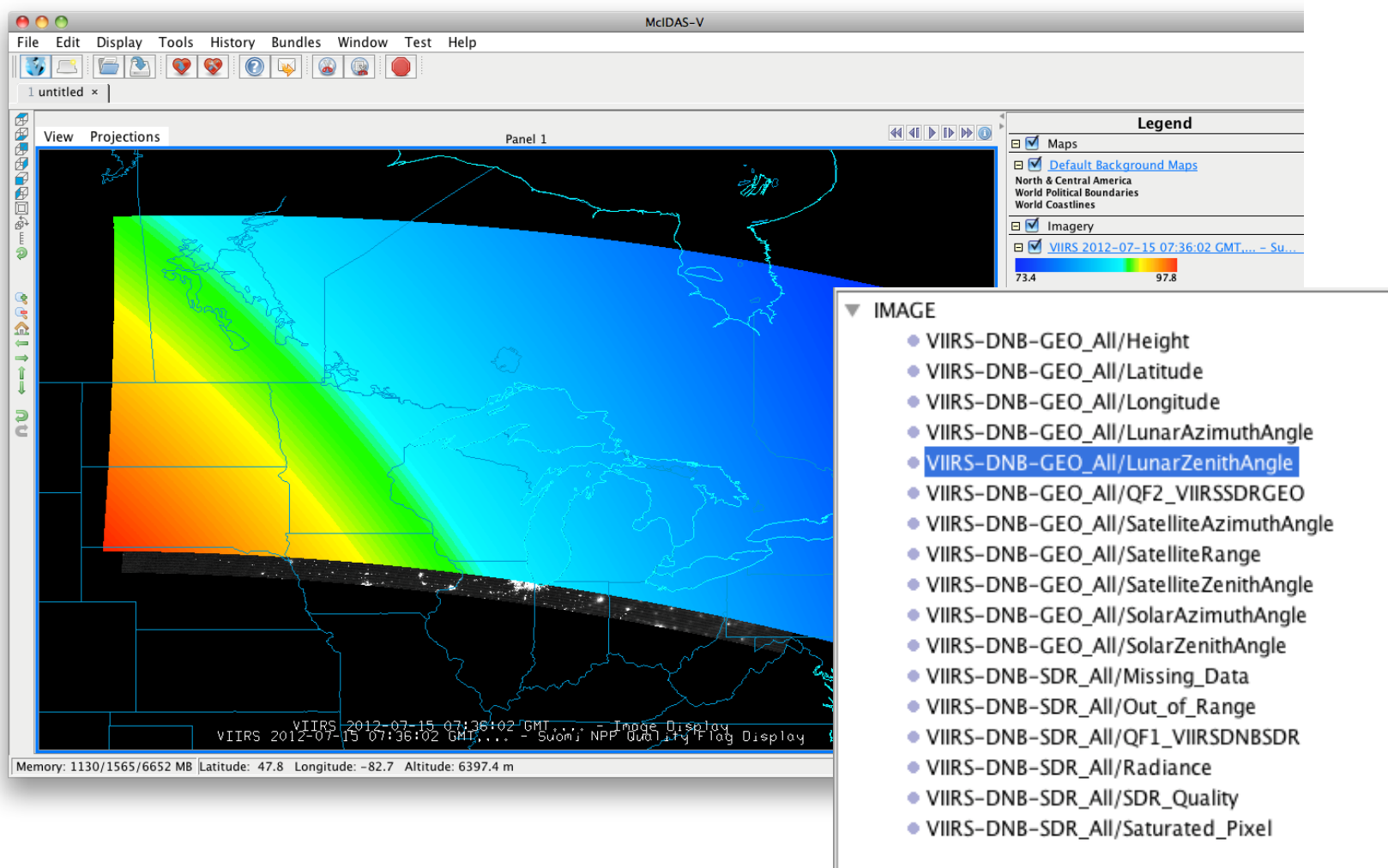




VIIRS Channel Differencing DNB Stray light example



VIIRS SDR Ancillary data





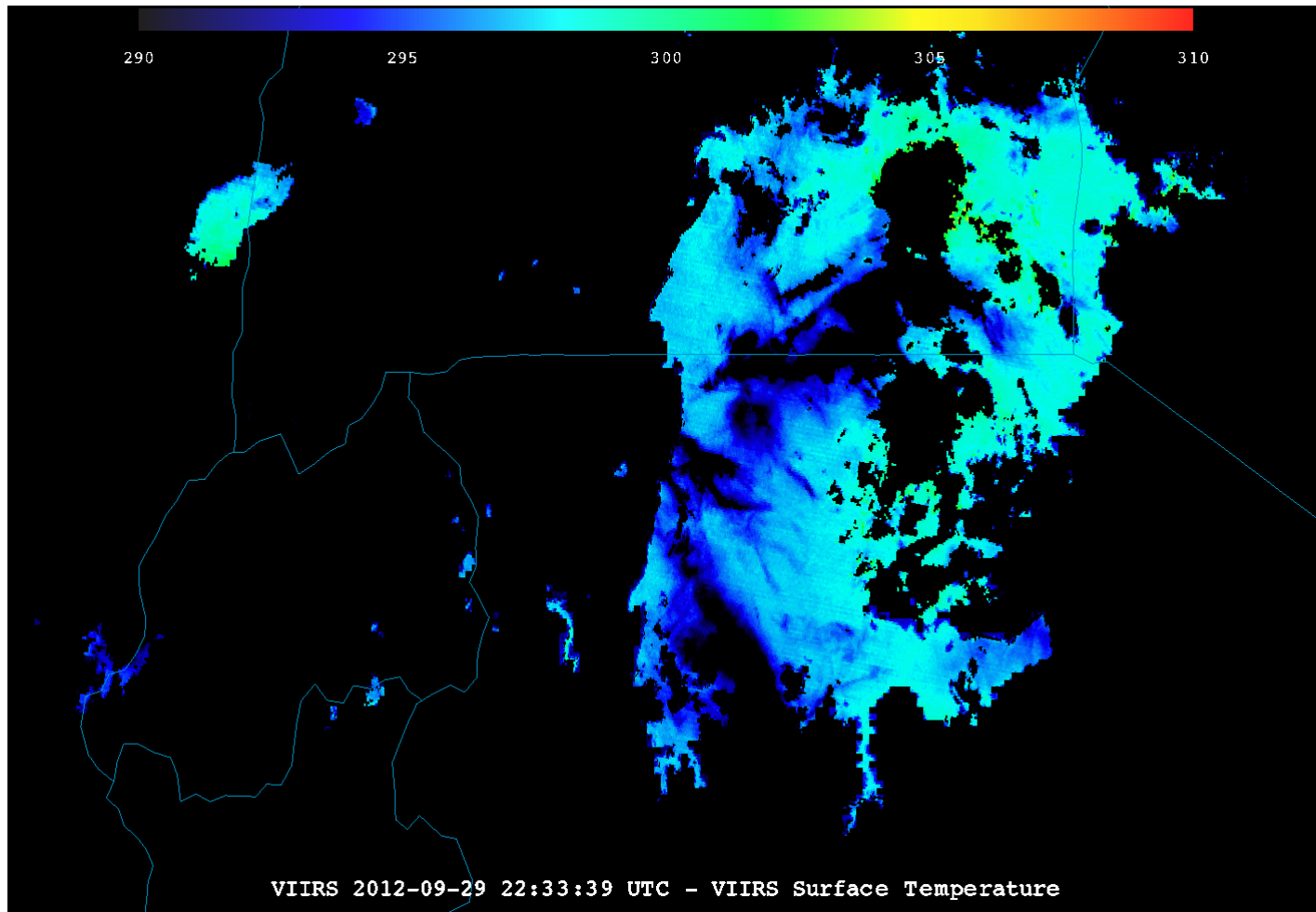
Visible Infrared Imaging Radiometer Suite (VIIRS) EDR



- There are a series of 20 Environmental Data Records (EDRs) produced from VIIRS from the IDPS
 - These algorithms are being migrated to the Enterprise algorithms
- McIDAS-V has been able to successfully ingest all EDRs including NDE Enterprise output
- McIDAS-V can unpack and display bit level data for IDPS data.
 - Ex. Displaying VCM test results
 - Will be working on unpacking bits for Enterprise algorithms

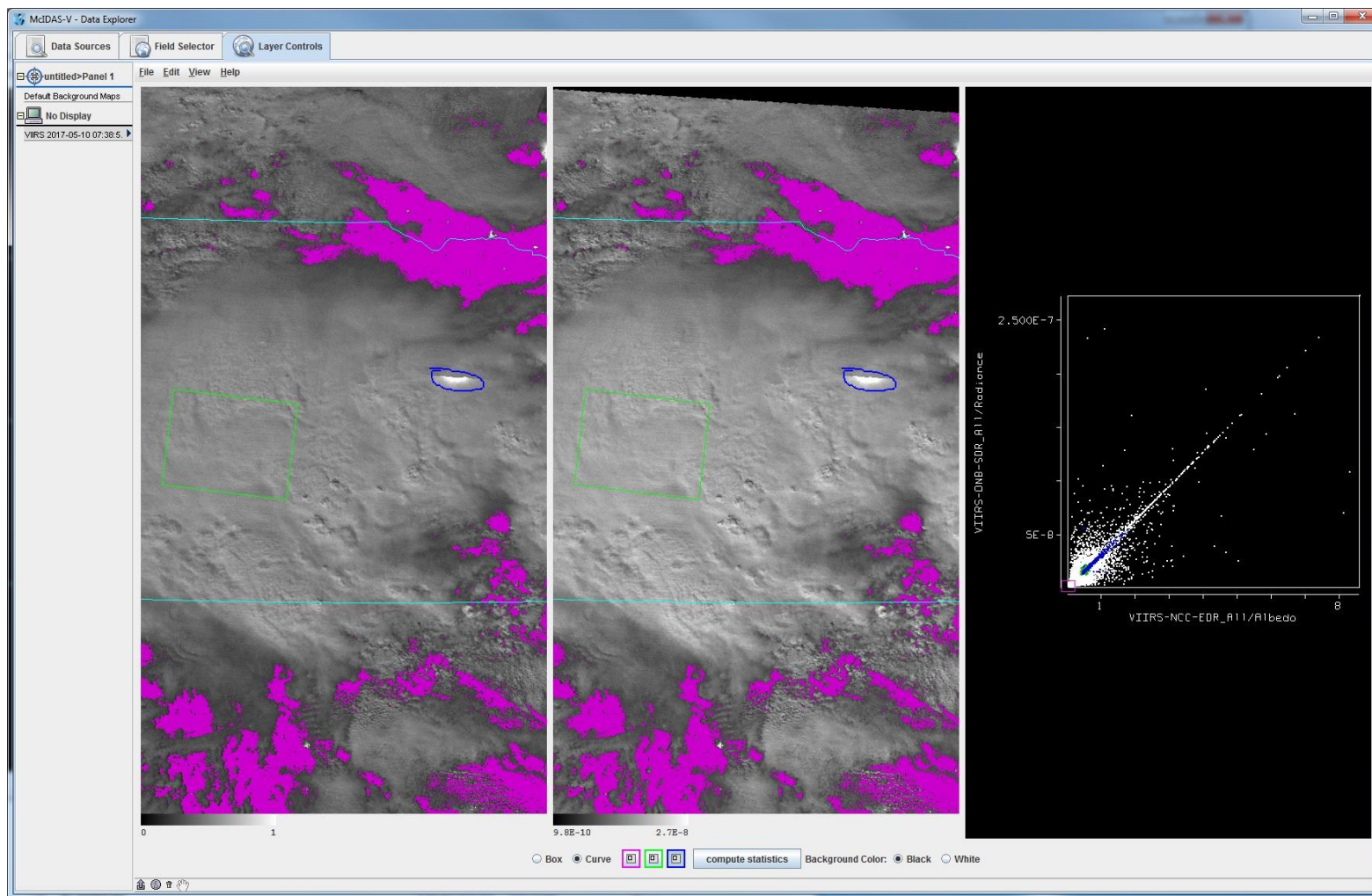


VIIRS DNB and Surface temperature EDR 2236Z, 09/29/2012



Imagery EDR example

Scatter analysis



Product EDR Variable selection

McIDAS-V - Data Explorer

Data Sources Field Selector Layer Controls

Data Sources:

Formulas

VIIRS 2013-04-16 08:19:56

Fields

IMAGE

- VIIRS-CM-IP_All/Adjacent_Pixel_Cloud_Confidence_Pixel
- VIIRS-CM-IP_All/Cirrus
- VIIRS-CM-IP_All/Cirrus_IR
- VIIRS-CM-IP_All/Cloud_Detection_and_Confidence_Pixel
- VIIRS-CM-IP_All/Cloud_Mask_Quality_Pixel
- VIIRS-CM-IP_All/Cloud_Phase
- VIIRS-CM-IP_All/Conifer_Boreal_Forest
- VIIRS-CM-IP_All/DayNight_Pixel
- VIIRS-CM-IP_All/Degraded_Polar_Night
- VIIRS-CM-IP_All/Degraded_Sun_Glint_in_Pixel
- VIIRS-CM-IP_All/Degraded_TOC_NDVI
- VIIRS-CM-IP_All/Dust_Candidate
- VIIRS-CM-IP_All/Dust_or_Volcanic_Ash_is_present
- VIIRS-CM-IP_All/Ephemeral_Water_Detected
- VIIRS-CM-IP_All/Fire_Detected
- VIIRS-CM-IP_All/High_Cloud
- VIIRS-CM-IP_All/IR_Temperature_Difference_Test_BTMI4-BT
- VIIRS-CM-IP_All/IR_Threshold_Cloud_Test_BTMI5
- VIIRS-CM-IP_All/LandWater_Background_Pixel
- VIIRS-CM-IP_All/Non_Cloud_Obstruction
- VIIRS-CM-IP_All/QF1_VIIRSCMIP
- VIIRS-CM-IP_All/QF2_VIIRSCMIP
- VIIRS-CM-IP_All/QF3_VIIRSCMIP
- VIIRS-CM-IP_All/QF4_VIIRSCMIP
- VIIRS-CM-IP_All/QF5_VIIRSCMIP
- VIIRS-CM-IP_All/QF6_VIIRSCMIP
- VIIRS-CM-IP_All/Shadow_Detected_Pixel
- VIIRS-CM-IP_All/Smoke_Candidate
- VIIRS-CM-IP_All/SnowIce_Surface_Pixel
- VIIRS-CM-IP_All/Spatial_Uniformity_Test_Pixel

Displays

Imagery

Image Display

Image Display Over Topography

Image Sequence Display

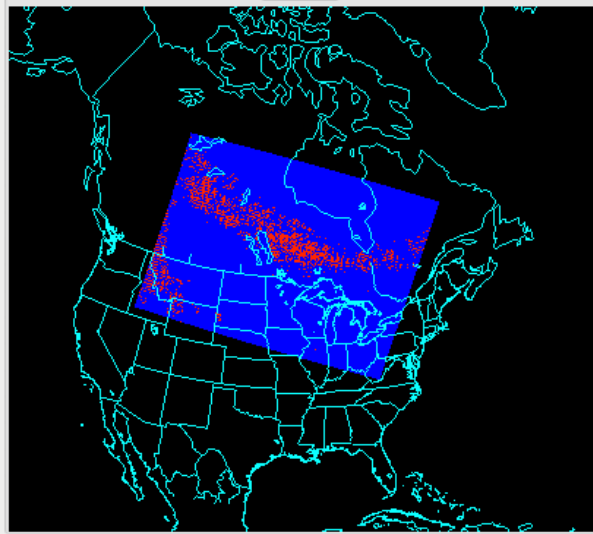
3 Color (RGB) Image

3 Color (RGB) Image over topography

MultiSpectral Display

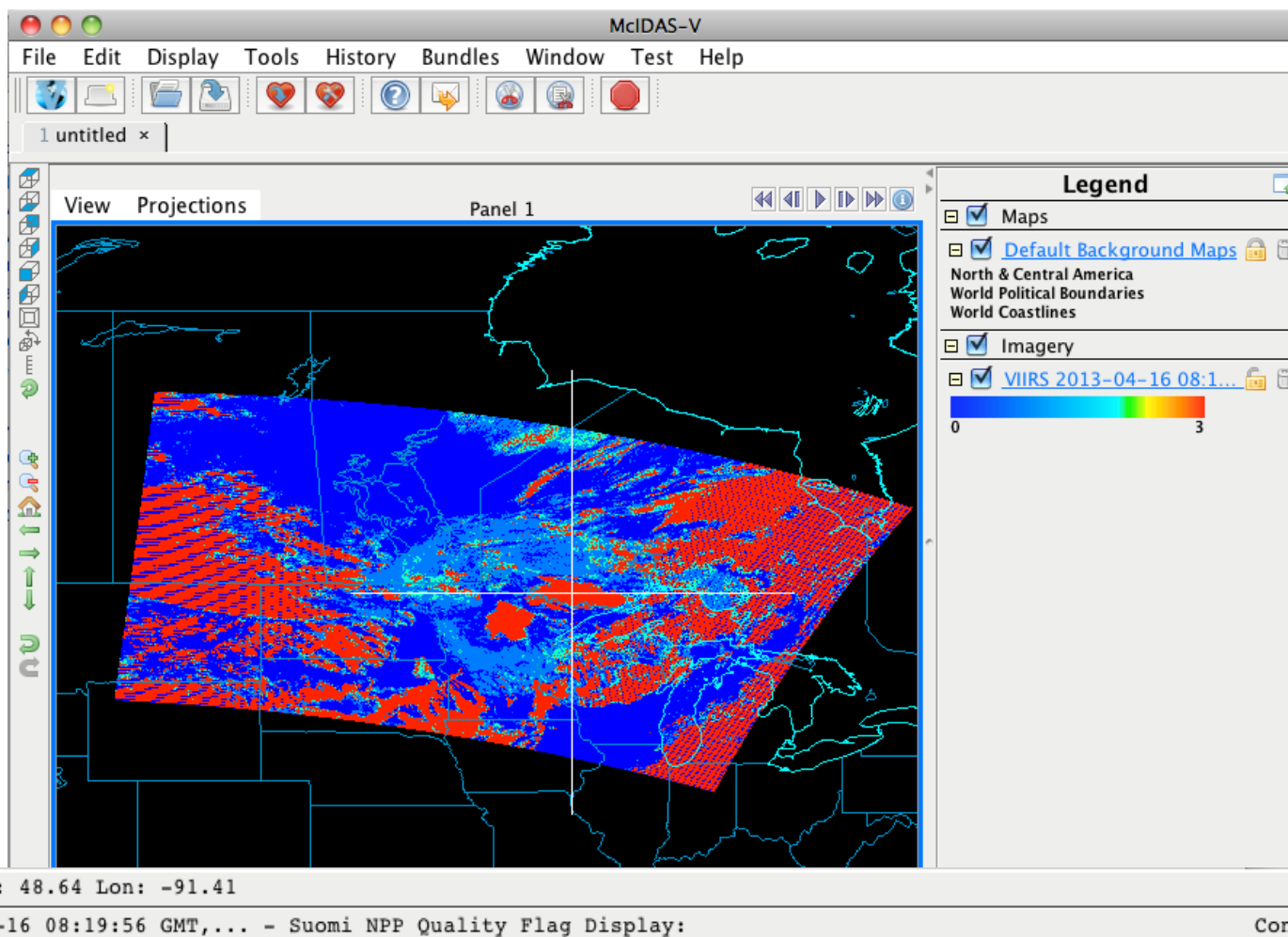
ProfileAlongTrack Display

Region



Create Display

Product EDR Data Probe

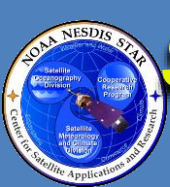




S-NPP/NOAA-20 specific McIDAS-V 1.7 Updates



- Support for the VICMO cloud mask EDR (released March 2017) as well as backwards compatibility with IICMO data.
- Added a new "show variables" button to the Field Selector tab of the Data Explorer which can show the variable shortname or (if present) long name.
- VIIRS Formulas plugin that gives formulas to remove the bowtie deletion and create RGB displays without the bowtie
- Added several VIIRS specific Scripting functions to load and grab information and create RGBs from SNPP/J1 files.
 - Example – “True color” RGB function
(<http://mcidas.ssec.wisc.edu/forums/viewtopic.php?f=31&t=1912&sid=e0bc1d9c9ac28f776ab6669136d75e1c>)



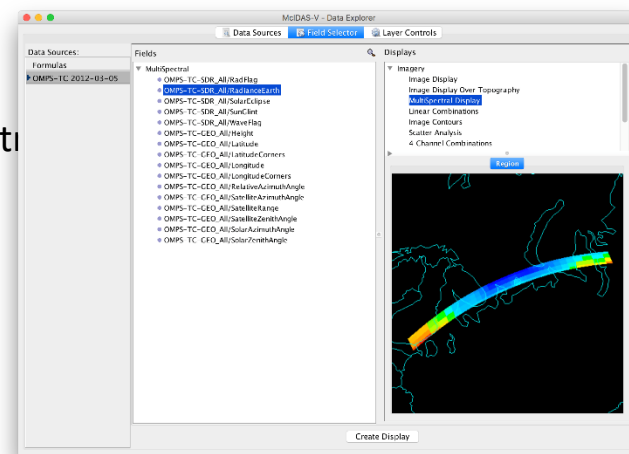
S-NPP/NOAA-20 Updates since McIDAS-V 1.7 in Nightly Build



- Support added for CrIS Full Spectrum data.
- Chooser rename to JPSS (it's not just for Suomi any more!)
- Reordering of fields provided now (e.g. M bands used to be listed out of order in multibanded VIIRS files)
- Better time formatting in scripting functions
- Generalization and renaming of scripting functions, with deprecation warnings provided

Needed features for JPSS activities

- Support for visualizing granules which straddle the dateline (note, this issue occurs with other polar and geo data)
- Support for OMPS
 - Needed for comparisons and visualizations with other instruments
 - Currently in testing
- Support for Active Fires products
- Support for NUCAPS
- Support for non-CF 3-D variables
- Output in other GIS-type formats (ex. geoTIF)
 - Google KML/KMZ files often either don't display properly in other GIS viewers other than Google Earth.
 - This is needed for comparisons and interactions with other groups, both in cal/val and other activities.

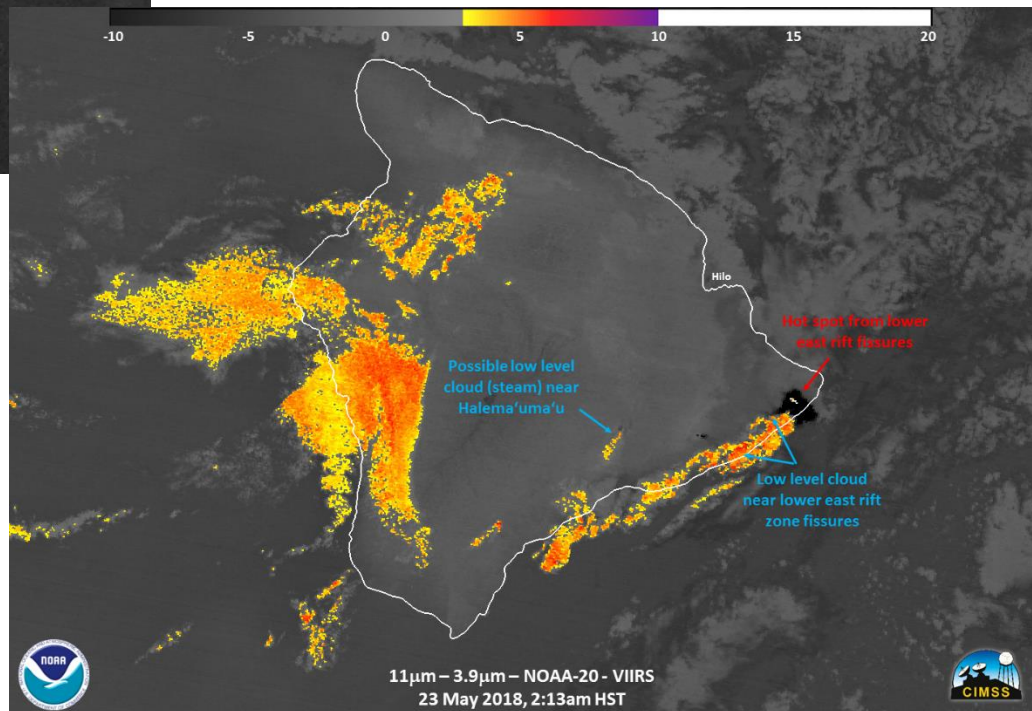
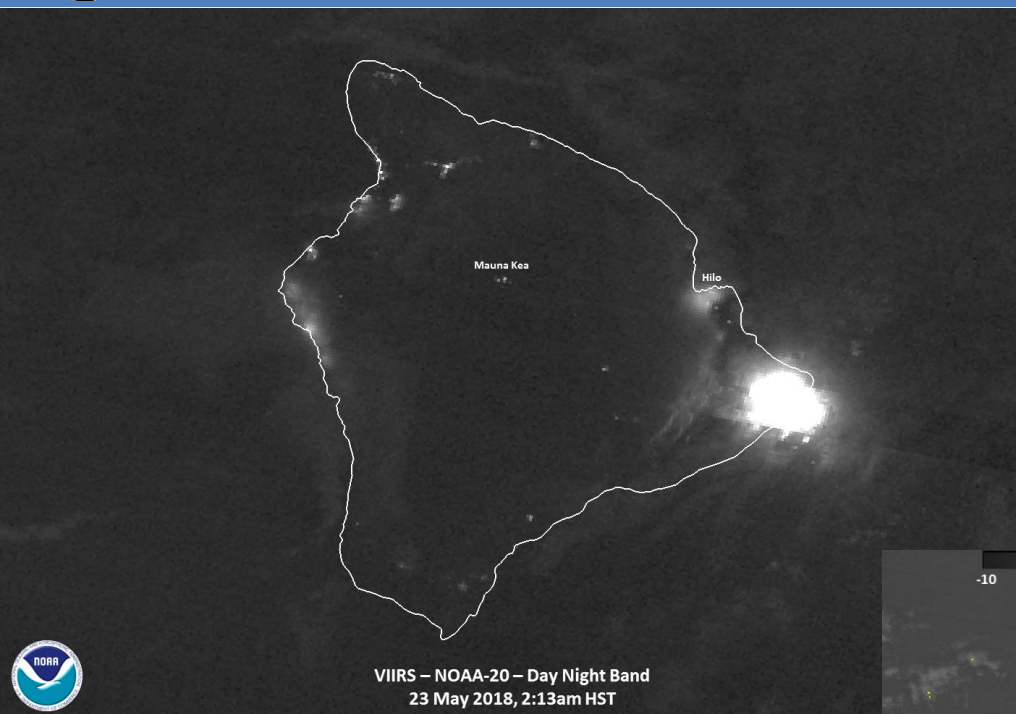




EXAMPLES OF MCIDAS-V USED FOR JPSS

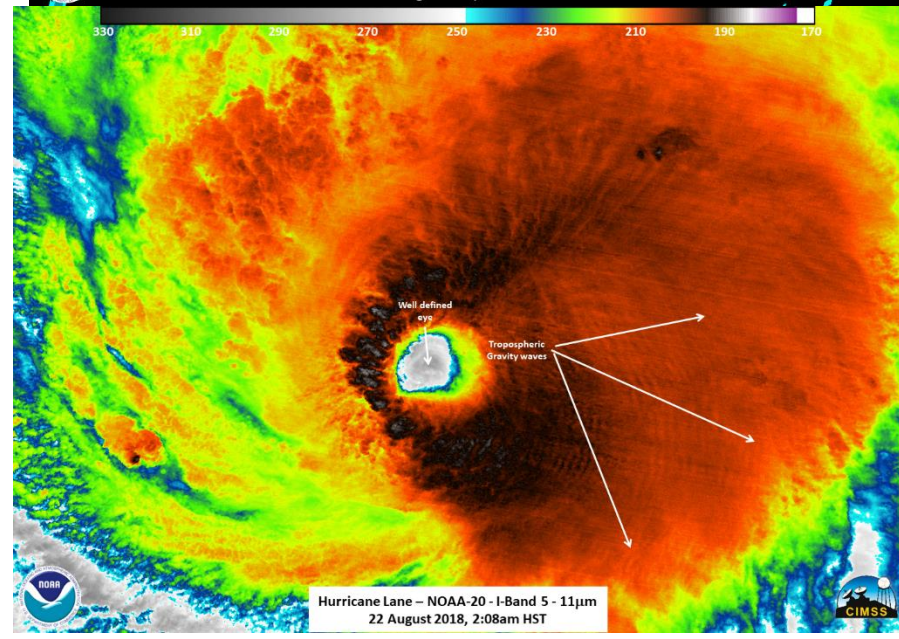
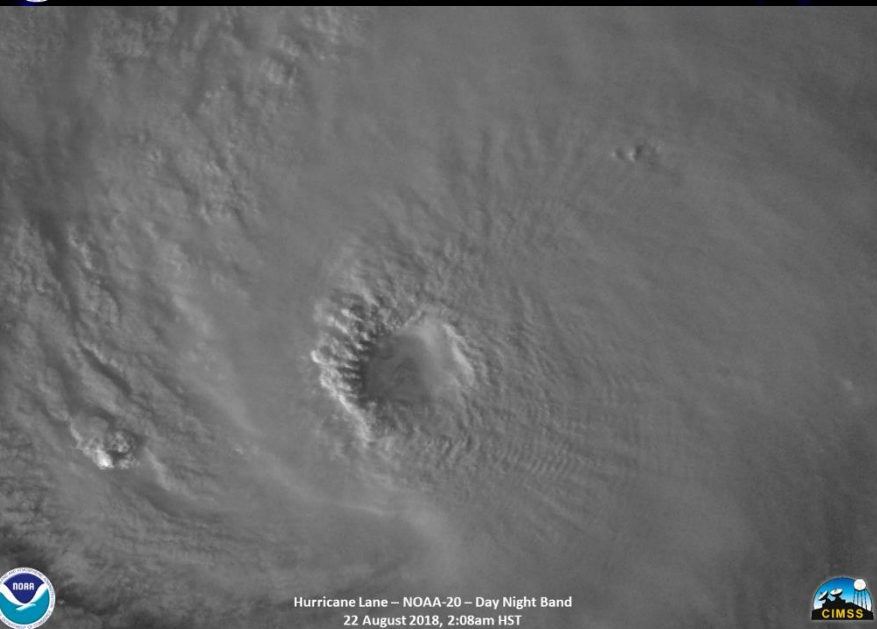
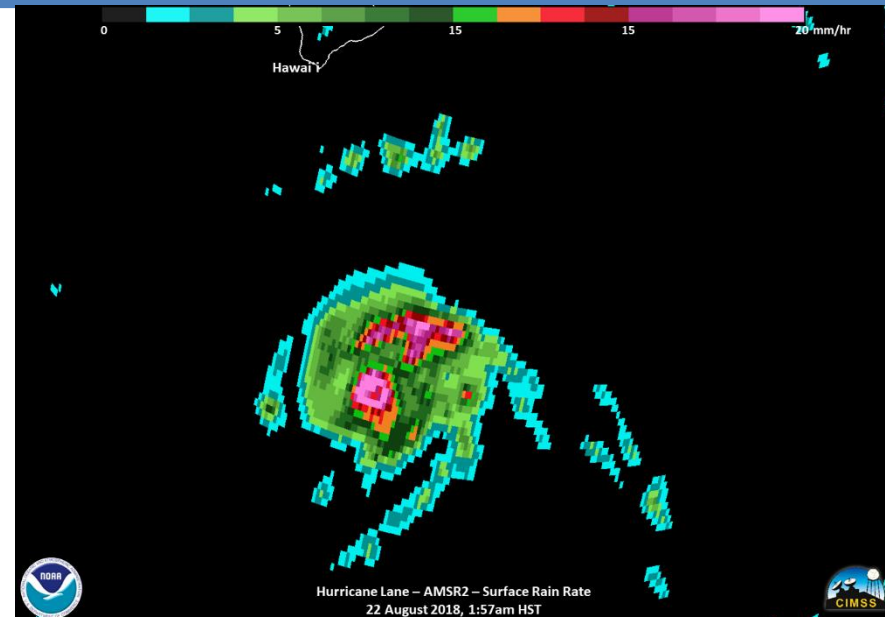
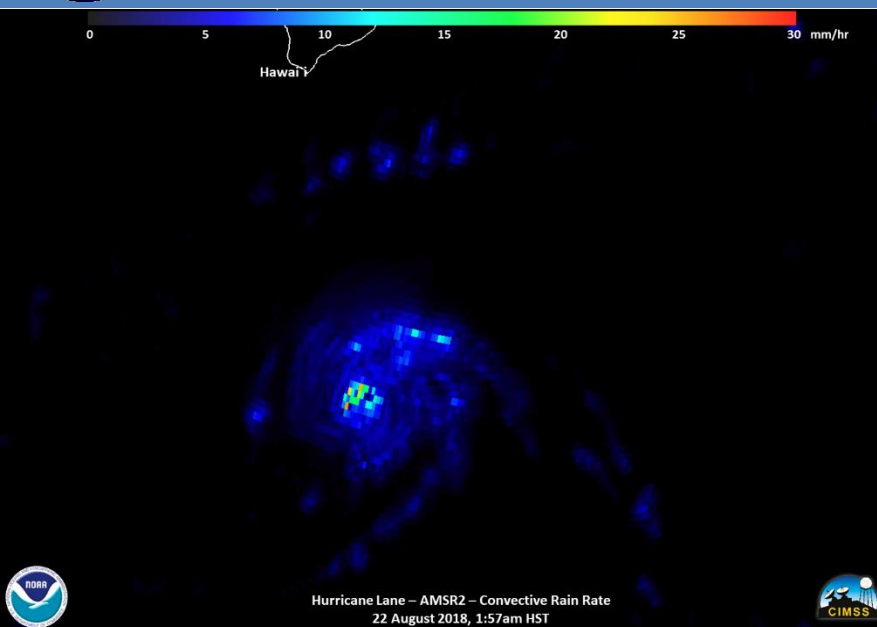
NOAA-20

2018 lower Puna lava outbreaks

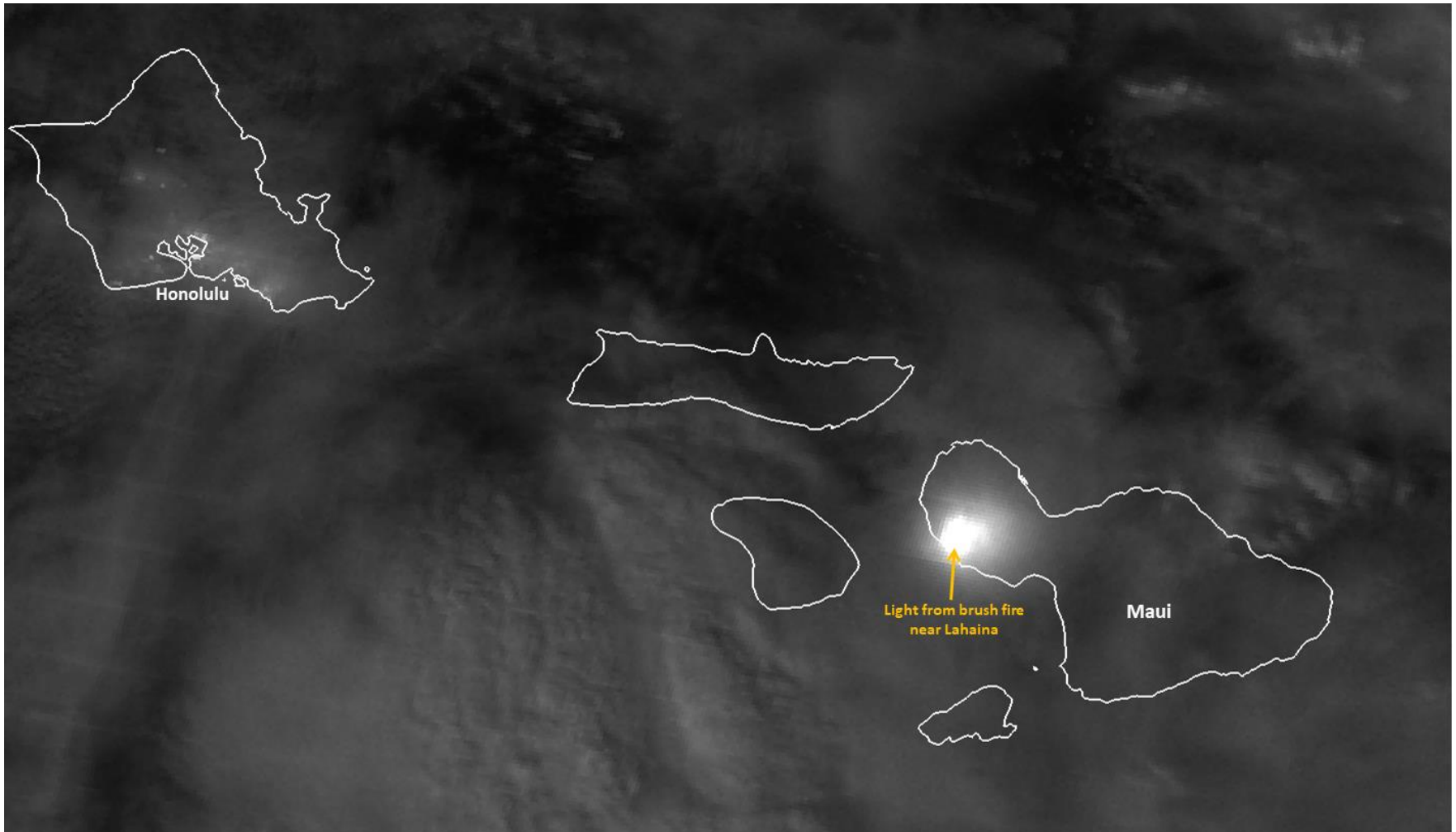




NOAA-20 Hurricane Lane



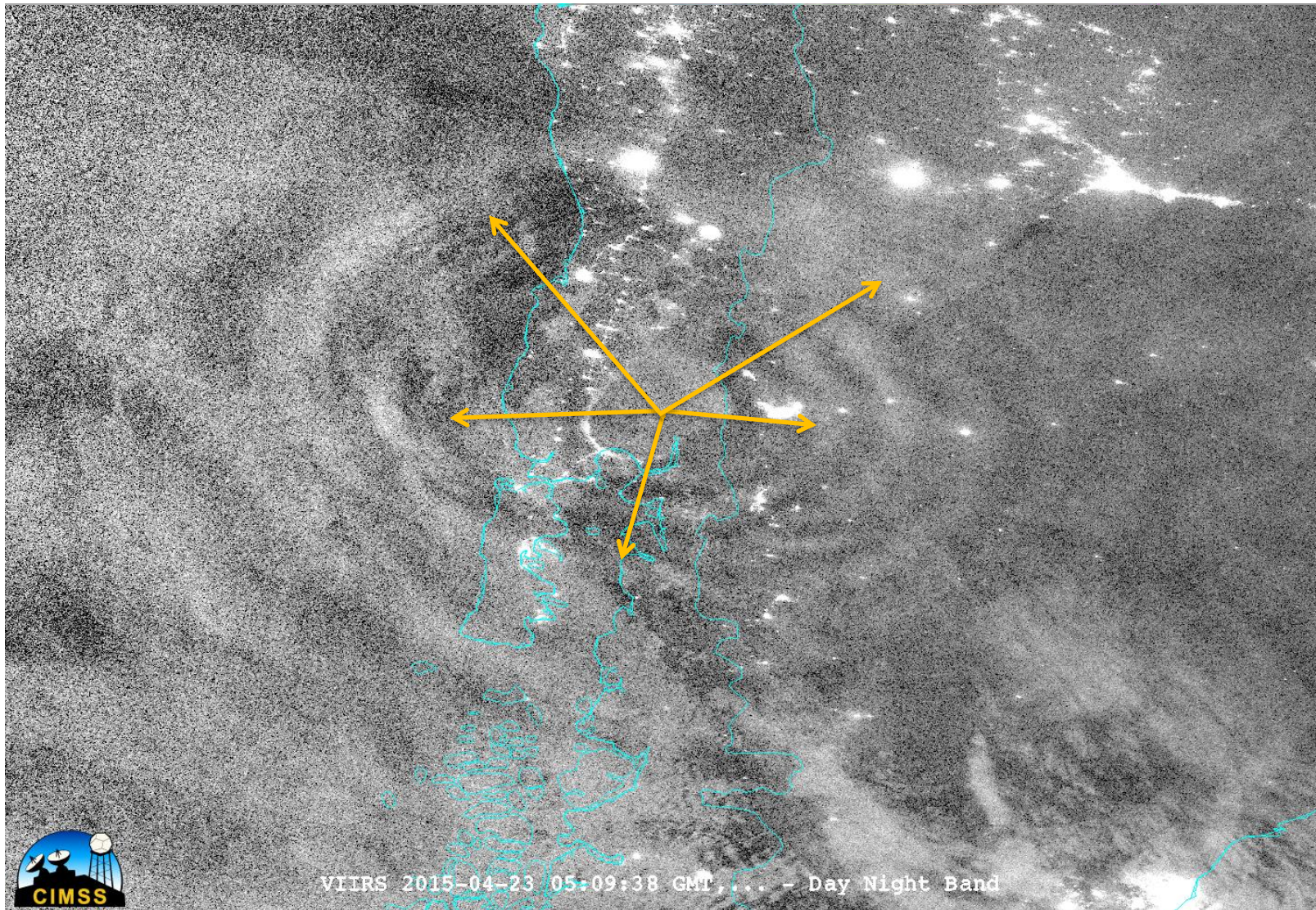
S-NPP Hurricane Lane



Imagery used by FEMA,
USPACCOM and Copernicus
EMS to show that one could
indeed see the wildfires on Maui
as Hurricane Lane passed by.

S-NPP – Day Night Band
24 August 2018, 2:20am HST

Mesospheric Gravity Wave monitoring

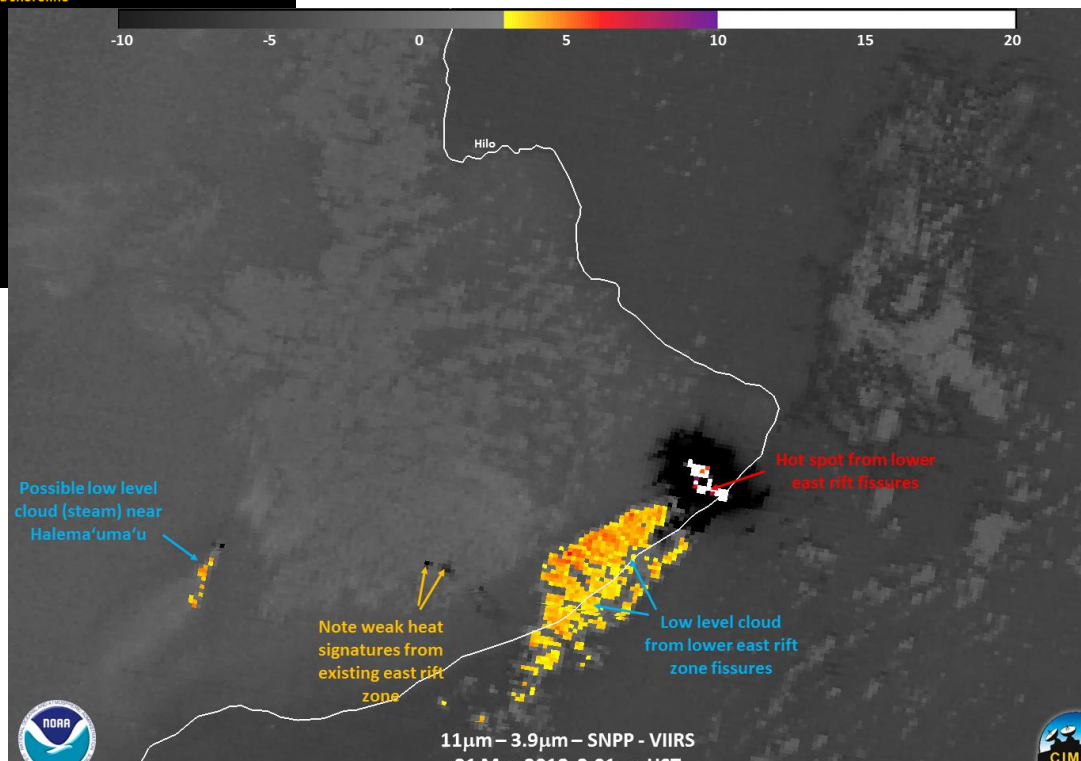
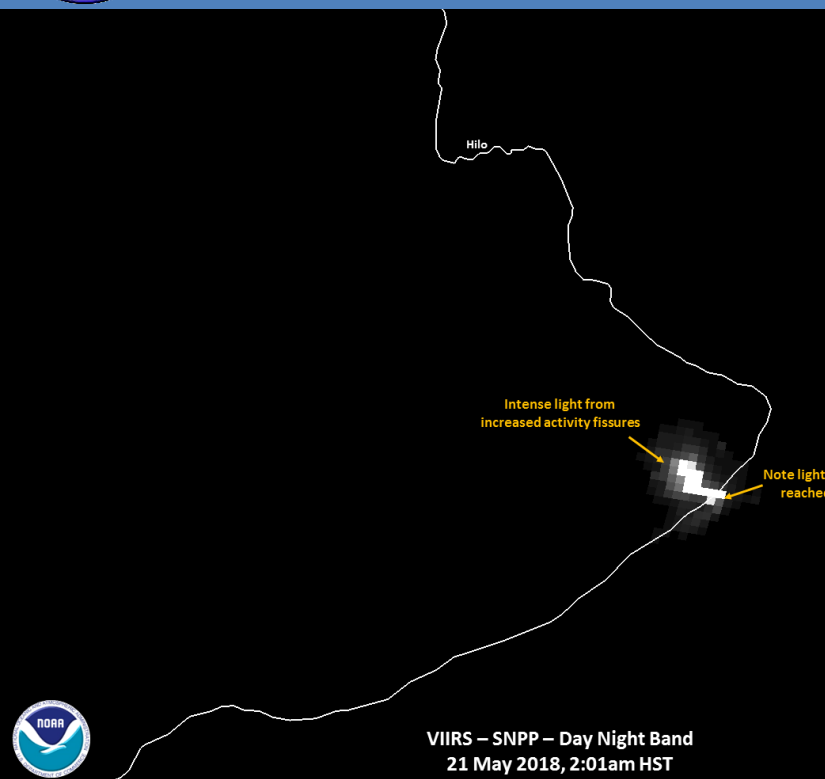




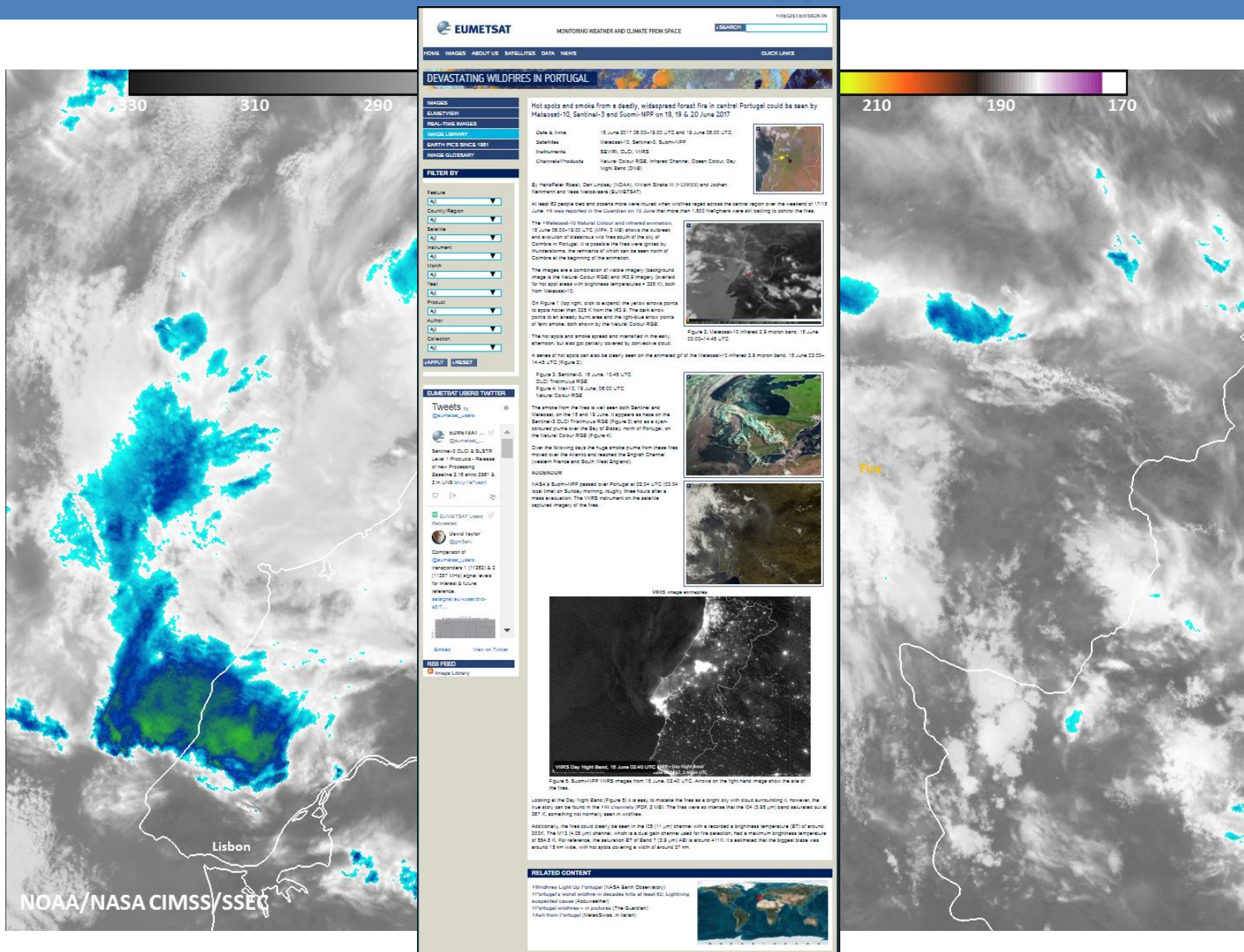
EXTRA SLIDES

SNPP

2018 lower Puna lava outbreaks



Disaster monitoring Fires and Smoke support





MONITORING WEATHER AND CLIMATE FROM SPACE

HOME IMAGES ABOUT US SATELLITES DATA NEWS

WELCOME TO EUMETSAT

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SEARCH



MASSIVE ICEBERG BREAKS OFF FROM ANTARCTICA Click the image to view further details

STAR JPSS

STAR Joint Polar Satellite System Website

Maintaining the continuity of climate observations and critical environmental data from the polar orbit — Increasing the timeliness and accuracy of severe weather event forecasts

STAR JPSS Home

- JPSS Data Products
- Algorithm Cal/Val Maturity
- Product Operational Matrix
- Documentations

Product Monitoring

- ICVS
- EDR LTM Site

JPSS Instruments/SDRs

- ATMS
- CrIS
- VIIRS
- OMPS

Environmental Data Records

- Ocean Products
 - Sea Surface Temperature
 - Ocean Color
- Land Products
 - Active Fires
 - Land Surface Temperature
 - Surface Albedo
 - Surface Type
 - Surface Reflectance
 - Vegetation Index

STAR JPSS Website



NOAA/NASA CIMSS/SSEC
VIIRS - I-Band 5 - 11µm
14 July 2017, 04:30 UTC

Larsen C Ice Shelf Sheds a Big One!
Jeff Key; William Straka III

14-Jul-17 - Antarctica just shed a very large piece of the Larsen C ice shelf. A block of ice the size of the U.S. state of Delaware broke off sometime between July 10 and 12. This block of ice is now an iceberg named A-68.

VIIRS I5 false-color image (July 14, 2017, 04:30 UTC) clearly shows the iceberg (A-68) that had broken off the Larsen-C ice shelf, and a smaller iceberg breaking off of A-68.

[Click here](#) for more information about the event.

Latest JSTAR Updates

Validated Maturity Review for GCOM AMSR2 Day-2 Products (Sea Ice Characterization, Snow Cover/Depth, Snow/Water)

JSTAR Newsletter

Message from the Program Manager: Welcome to the new STAR JPSS Monthly Newsletter. September was a busy month

REGISTER NOW

EARLY BIRD REGISTRATION FEE UNTIL 15 JULY

EUMETSAT METEOROLOGICAL SATELLITE CONFERENCE 2017

ROME, ITALY, 2-4 OCTOBER 2017

THE EUMETSAT LEARNING ZONE

RESOURCES FOR EDUCATION AND HOMEWORK

NOAA/NASA CIMSS/SSEC

VIIRS – Day Night Band
12 July 2017, 0326 UTC